Q-1) a .Explain how the CALL and RET instructions operate.

When executing a CALL, the processor does the following

1. Pushes the current value of the IP register on the stack.
2. Loads the offset of the called procedure in the IP register.
3. Begins execution of the called procedure.

When executing a return RET , the processor performs these actions:

1. Pops the top-of-stack value (the return instruction pointer) into the IP register.
2. (If the RET instruction has an optional argument.) Increments the stack pointer by the number of bytes specified with the operand to release parameters from the stacK.

b.Rewrite the following code using PROC and ENDP:

```
FillMem: moval, 0FFh
FillLoop: mov[bx], al
          Inc bx
          loop FillLoop
          ret
```

.....	FillMem PROC NEAR
CALL FillMem	mov al, 0FFh
.....	FillLoop: mov[bx], al
.....	Inc bx
.....	loop FillLoop
.....	ret
	FillMem ENDP

c. The array C of 100 bytes is assumed to contain string of ASCII characters. Write an assembly language code to Check if it contains the '$' character and go to location HasDollar if it does.

```
 MOV SI , 00d
 MOV BX , OFFSET C
 ADD  BX , 2H
NEXT :
        MOV AL , [BX+DI]
        CMP  AL , '$'
         JZ  FINISH
         INC DI
         CMP  DI , 101d
         JZ  EXIT
         JMP  NEXT
FINISH :
         ADD BX ,DI
         ;  LOCATION OF '$' AT OFFSET BX.
         JMP END
 EXIT :    ; ASSCII NOT  FOUND
END:
```

Q-2) a.Write an ALP to generate square wave with period of 200µs and address of output device is 55H for 8086 microprocessor.

5MHZ --------- 1 CYCLE

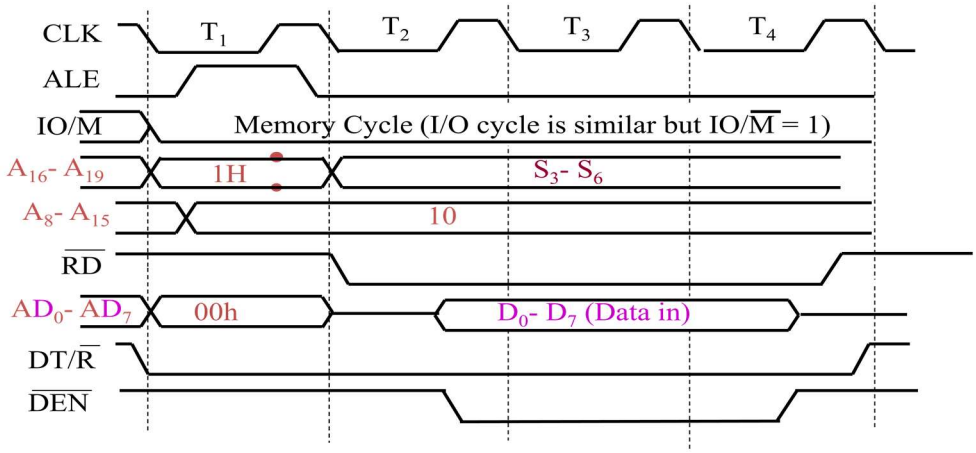
100µsec -------- Y cycle

Y = 250 cycle

```
again: mov  cx , ch
       mov al , 01 h
       out   55h , al
x :    nop
       loop x
```

```
    mov al ,00h
    out  55, al
x :  nop
     loop x
     jmp   again
```

b. For 8088 system , draw the timing diagram for the following instruction : Mov AL, [1000] ? ASSUME DS=1000H



Q-3)a. describe the action taken by 8086 when NMI pin is activated ?

Whenever an external device activates this pin, themicroprocessor will be interrupted. This signal cannot be masked. NMI has interrupt vector number 2 , where it edge triggerred pin.

b. If the interrupt service routine (ISR) of the interrupt source (INT 10H) has located at a logical address (1500:E308H). Write the instruction required to initialize the interrupt vector table in order to handle this interrupt.

N = 10h *4 = 40

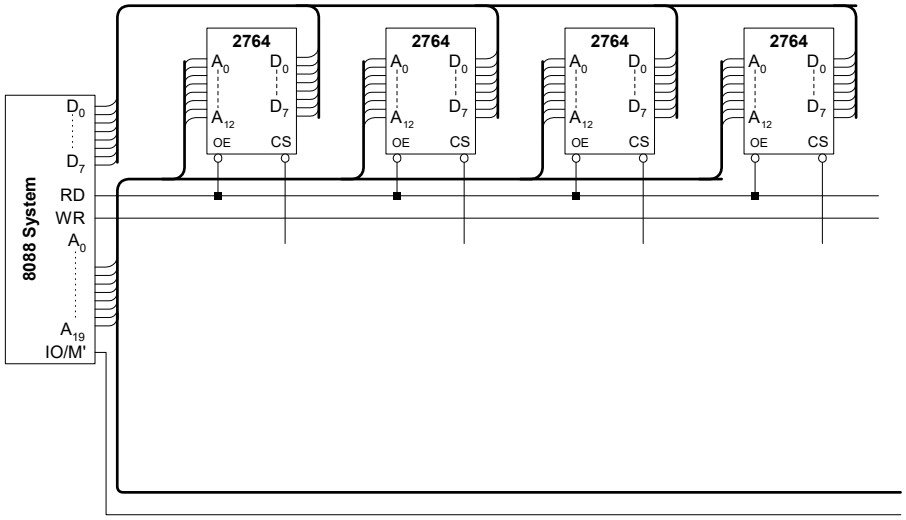
```
mov ax , 00h
mov ES ,ax
mov si , 40
mov es:[si], E308h
mov es:[si+2],1500h
```

Q-4) a.You are requested to interface a **32 KB EPROM** to an **8088** microprocessor in the minimum mode. The 32 KB EPROM consists of **4 of EPROM chips.** If the last address of the EPROM is **FFFFFH**, design the *decoding circuit* to generate the chip select signals for the EPROM chips by using an appropriate decoder and any additional logic, if needed.

each 8KB need 13 address line , A0- A12

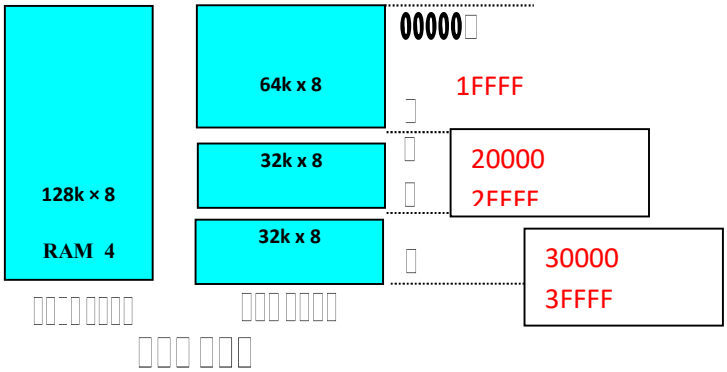
A19	A18	A17	A16	A15	A14	A13	A12	A11 - A0	
1	1	1	1	1	1	1	1	FFF	FFFFF
1	1	1	1	1	1	1	0	000	FE000
1	1	1	1	1	1	0	1	FFF	FDFFF
1	1	1	1	1	1	0	0	000	FC000
1	1	1	1	1	0	1	1	FFF	FBFFF

1	1	1	1	1	0	1	0	000	FA000
1	1	1	1	1	0	0	1	FFF	F9FFF
1	1	1	1	1	0	0	0	000	F8000

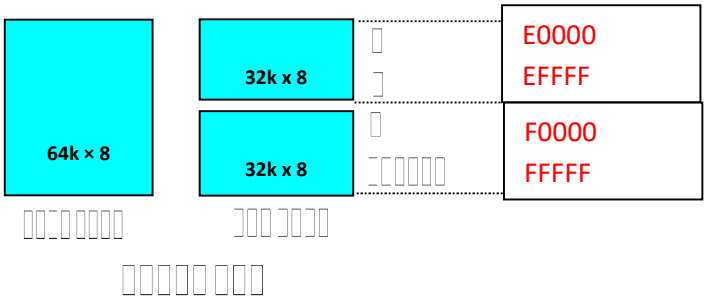


b. You are asked to interface an additional **256 KB RAM** and **128 KB EPROM** to an **8086** microprocessor in the minimum mode. Answer all of the following questions:

(1) The **256 KB RAM** consists of **four** RAM chips. If the starting address of the RAM is **00000H**, fill-in the boundary addresses on the following memory map.



(2) The **128 KB EPROM** consists of **three** EPROM chips. If the last address of the EPROM is **FFFFFH**, fill-in the boundary addresses on the following memory map.



**********GOOOD LUCK **********